Space Weather Forecast

Issued on Sunday, 25 February 2024 at 13:09 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

---

Space Weather Forecast Headline: Ongoing likelihood of Moderate flares with a chance of Strong flares due to a large sunspot. Chance of G1/Minor Storm intervals either late day 1 or early day 2 (25-26 Feb)

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low, with only common class flares observed, all from the large sunspot in the north-centre disc. This region continued to show a very slow increase in area but only limited complexity. Despite some opposite magnetic polarities being observed within the same large spots, the strongest areas of these different polarities remain well separated and without too much mixing. This has likely been the reason for only limited flare activity in the period. There are five other sunspot regions on the disc, however these are all much smaller and simpler.

There were no Earth directed coronal mass ejections (CMEs) observed in available imagery.

Solar Wind / Geomagnetic Activity: A weak, glancing CME arrived at 24/1617 UTC, from the eruption on 21 Feb, however solar winds remained mostly background to slightly elevated. Solar wind speed rose from near 300km/s to around 350-400km/s with the CME arrival, then climbing to peak around 450 km/s between 25/0200-0600 UTC before easing back to background, near 350km/s by 25/1200 UTC. Total Interplanetary Magnetic field (IMF) strength also rose to at 24/1617 UTC to be mainly moderate thereafter. The north-south component rose to be moderate, and was variable in direction until 24/1950 UTC, then briefly positive (northward) until 24/2300 UT, then variable but mainly negative (southward) thereafter. Geomagnetic activity was Quiet to Unsettled (Kp 2-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was very slightly above background due to the lingering effects of the previous enhancements that started on 09 Feb. However this remained well below the S1 Minor Solar Radiation Storm level.

Four-Day Space Weather Forecast Summary

Solar Activity: Activity is forecast to be Low to Moderate, with isolated M-class flares likely. There remains a chance of isolated X-class flares from AR3590.

Solar Wind / Geomagnetic Activity: Background solar winds are likely to become enhanced later day 1 (25 Feb), from the onset of the fast wind from a coronal hole, before peaking into day 2 (26 Feb). These fast winds easing day 3 (27 Feb). Quiet activity at first becoming Unsettled to Active with a chance of G1 Minor Storms from coronal hole fast wind onset on day 1 or 2 (25-26 Feb). Quiet to Unsettled activity returning day 3 and 4 (27-28 Feb).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to remain at or near background, but with chance of becoming enhanced due to any significant flares from the large sunspot on the disc. This giving a slight chance of exceeding the S1 Minor Radiation Storm level.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2024. All Rights Reserved.

Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	25	25	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	60	60	60	60
Very Active	R3 to R5 X	No	25	25	20	15

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	15	20	20	20
Very Active	≥ S3 *	No	1	5	5	5

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2024. All Rights Reserved.